e-ISSN : 26203502
p-ISSN : 26153785

Math Aiders Mentoring Program as Remedial Class for Low-Performing Learners

Amy B. Belonio
Granada National High School-Ballesteros Campus
amyblenio1@gmail.com

June Rey S. Sulatra
Northern Iloilo State University
junereysulatra@gmail.com

Abstract: Peer mentoring is one of the strategies used to enhance learners' mathematics achievement. This study developed a mentoring program that trains the potential higher grades high performing learners to become one of the "Math Aiders" to mentor the low performing learners in lower grades. The math aiders underwent a series of exams and training to become a mentor. Each mentor was assigned to three to five learners. This study was conducted in one secondary island school in Western Visayas, Philippines. Eighty (80) Grade 7 learners and twenty (20) "math aiders" were the participants of the study. A quasi-experimental method was used and the participants were grouped into two (2), the non-experimental (teacher only) and experimental group (math aiders and teacher as facilitator). The mentoring program was done after class hours, specifically at five o'clock in the afternoon (the time for the remedial class for low-performing learners). The instrument used was a researcher-made achievement test in Mathematics 7 which underwent validity and reliability testing. The findings of this study revealed that there is a significant increase in mathematics achievement in both interventions. Comparing the posttest between two groups, the learners' mathematics achievement was higher in the math aiders mentoring program group compared to the non-experimental group which is teacher alone instruction. This means that mentoring activity can be utilized as one of the interventions in the remedial classes to address the decrease in learners' achievement in mathematics.

Keywords: mathematics achievement, remedial class, mentoring program, quasi-experimental.

Introduction

As students are promoted to a new grade level each academic year, they continue to struggle academically, and they continually digress as standardized test scores reveal below-level performance (Acharya, 2017). Since mathematics is one of the most important school subjects in the curriculum worldwide, it is also a subject that cuts across the primary and secondary school as a compulsory subject (Sa'ad, Adamo, and Sadiq, 2014). According to Umameh (2011), mathematics is a foundational and vital instrument for every nation's scientific, technological, and economic growth. Furthermore, Davies and Hersh (2012) see mathematics as a vital subject not only for obtaining an academic certificate at school or college, but also for preparing pupils for the future, regardless of the field of job they want to pursue. However, as of today, learners' performance in mathematics is deteriorating. According to (Muijus and Reynolds 2008), successful teaching is crucial since it is built on assisting children in progressing from one level to another in a more sociable engaging setting, as well as getting the technique right to get students to be autonomous learners.

e-ISSN : 26203502
p-ISSN : 26153785

Teachers are not always able to spend a significant amount of time with struggling students. Due to the large number of students for whom teachers are responsible, engaging with all pupils on a daily basis and satisfying all of their requirements is nearly impossible (Judd, 2017). This is why teacher plays a vital role in the learning process of their students since teachers are the front liner of the school to educate children. As time pass by, students' performance in school is deteriorating especially in mathematics. As far as the school is concerned, this is a very alarming situation.

Mentoring has been shown to be an effective strategy for enhancing young people's outcomes (Petosa and Smith, 2014). According to Thompson and Kelly-Vance (2001), mentoring programs could be part of the answer to the many school-related problems that at-risk youth face such as academic failure in school and dropping out. Anyone who is capable and has the knowledge to teach can be a mentor, to help their fellow learners to improve their academic performance. Also, it leads to social interaction and develops their self-esteem in that they can ask questions without hesitation. Mentoring can be summarized as the matching of a youth to a non-parental adult figure who serves as a role model and provide support for that youth (Anastasia, Skinner, & Mundhenk, 2012). Teachers applied different strategies in teaching in that way performance level of the students would increase.

The intervention in this study was peer mentoring in which learners have their companion to study, and teach them the lessons which they don't or are hard for them to understand. This study used the math aiders mentoring activity in which advanced learners are utilized to help as aiders or peer tutors to slow learners in math subjects. Math aiders are chosen among students who have the potential and qualification to be peer tutors to their schoolmates with low performance in mathematics. Thus, this study aimed to determine the effect of math aiders mentoring activity versus non-mentoring activity on the mathematics performance of the learners.

Methodology

A quasi-experimental pre-test-post-test design was used as the research design in this study. Two groups were initially observed as pre-tests to determine the differences between the groups at the beginning of the experiment and to serve as a basis for determining the gains of both groups at the latter part of an experiment. Then an intervention or treatment was introduced to the experimental group. The control group did not receive any treatment. After the intervention, a post-test is made. The participants of the study were the eighty (80) Grade 7 junior high school students in mathematics, comprised of two sections that served as experimental and control group, each with forty (40) students.

To establish the mathematics performance of students in each group, a 38-item multiple-choice test was constructed by the researcher with the Table of Specifications (TOS) to make sure that the test items jived with the competencies and were fairly distributed. Before the administration, the instrument was validated by three (3) experts in the field of mathematics. Through pilot testing, the reliability of the test was determined ($KR_{20} = 0.71$).

After all permissions for the conduct of the study were granted. The researcher oriented the selected participants in both groups of the flow of the remedial class. This was to motivate the students to make them realize their respective responsibilities as the participants in the study. In the mentoring group, the lesson guides were modified to suit the learners' needs and the worksheets were given to the math aiders ahead of time. The validated lesson guides for each group were used during the 6-week intervention stage.

Both groups with a total of 80 participants took the pretest on the first day of the intervention. One hour was allotted to finish the test, which was equivalent to the actual class hour of the intervention. In the non-mentoring activity group, learners were given problem-solving activities questions or situations and they worked as individuals or in a group. After the activity, some students were asked to explain the outcome or result in front of the class. Then, a short assessment test, in a form of exercise was given. With the mentoring group, math aiders

e-ISSN : 26203502
p-ISSN : 26153785

introduced the lesson to the respondents and the teacher guided and facilitated the flow of the session. A worksheet with a detailed procedure was given to the group which they worked on inside the classroom with the guidance of their teacher. They were also exposed to the use of technology inside the classroom. The progress of each group was monitored through quizzes, recitation, responses, and performance tasks based on the lesson guides. However, the tests which were given as assessment after the class was similar for both groups, to ensure that all other factors like topics, evaluation, and length of contact time is uniform except for the teaching strategies to be used. Students in both classes were also required to submit their journal notebooks after every module. The researchers also observed students' performances and have them recorded on an observation sheet.

At the end of the six weeks, the researchers administered the post-test. The results of the post-test were analyzed using the SPSS to determine any significant difference in the means of those students exposed to mentoring activity and those students exposed to the non-mentoring activity.

Results and Discussions

Performance of learners exposed to math aiders mentoring activity to non-mentoring activity.

The pre-test performance of learners exposed to math aider activity *(M =9.92, SD = 2.44)* and the non-mentoring activity approach *(M = 9.37, SD = 2.58)* was "Fairly Satisfactory" before the intervention. Results of the standard deviation showed that the spread of scores of both groups was nearly the same in terms of their mathematics performance. This shows that the two groups were homogenous concerning their pre-test performance in mathematics.

After the intervention learners exposed to math aider activity *(M =17.55, SD =3.34)* had improved to "satisfactory" while those in non-mentoring activity *(M =24.23, SD =3.44)* were "very satisfactory". After the intervention, both the students who were exposed to math aider activity and non-mentoring activity had improved in their mathematics performance.

Table 1. Pre-Test and Post-Test Performance of Learners Exposed to Math Aiders Mentoring Activity and Non-mentoring Activity

	N	Mean	SD	Description
Pre-test				
Mentoring	40	9.92	2.44	Fairly Satisfactory
Non-mentoring	40	9.37	2.58	Fairly Satisfactory
Post-test				
Mentoring	40	17.55	3.34	Satisfactory
Non-mentoring	40	24.23	3.44	Very Satisfactory

Note: 30.50-38.00-Outstanding; 22.88-30.49- Very Satisfactory; 15.23-22.87-Satisfactory; 7.70-15.22- Fairly Satisfactory; 0.00-7.69- Did not meet expectation

The difference in the pre-test performance of learners exposed to math aiders mentoring activity and those exposed to the non-mentoring activity

The result shows that there is no significant difference in the pre-test scores of the learners exposed to math aiders mentoring activity *(M=9.93, SD=2.44*) and non-mentoring activity *(M=9.37, SD=2.57), t(78)=-.97, p=.33.* This, showing learners in both groups were comparable at the start of the experiment.

Table 2. The difference in the Pre-Test Performance of Learners Exposed to Math Aiders Mentoring Activity and Those Exposed to Non-Mentoring Activity

	Mean	SD	Mean Difference	CI Lower	Upper	t	df	p
Mentoring	9.93	2.44						
			-0.55	-1.66	0.56	-0.97	78	.33
Non-mentoring	9.37	2.58						

e-ISSN : 26203502
p-ISSN : 26153785

Difference between the pre-test and post-test performance of learners exposed to math aiders mentoring activity and to those exposed to the non-mentoring activity

A paired-samples t-test was conducted to determine the difference in the learners' scores in the pretest and posttest. There was a statistically significant increase in pretest *(M=9.92, SD=2.44*) and posttest *(M=24.23, SD=3.43)* scores in the math aiders mentoring activity, *t (39) =-34.10, p<.0000 (two-tailed).* Also, for the non-mentoring activity, significant difference was also recorded from pretest (*M=9.37, SD=2.57)* and posttest *(M=17.44, SD=3.34)* scores, *t (39= -20.68,* p<.0000 (two-tailed). The study showed that there was an improvement in the mathematical performance of the learners after they underwent mentoring. It means that capable learners could help also their classmates or schoolmates to perform well in math.

Table 3. The difference in the Pre-Test, and Post-Test Performance of Learners Exposed to Mentoring Activity and Non-Mentoring Activity.

	Mean	SD	Mean Difference	CI Lower	CI Upper	t	df	p
Mentoring			-14.30	-15.15	-13.45	-34.10	39	0.001*
Pretest	9.92	2.44						
Posttest	24.23	3.43						
Non-mentoring			8.17	-8.97	7.38	-20.68	39	0.001*
Pretest	9.37	2.57						
Posttest	17.55	3.34						

The difference in the post-test performance of learners exposed to mentoring activity and non-mentoring activity

Comparing the post-test scores of learners in both groups, results revealed that there was a significant difference in the post-test performance of the learners exposed to math aiders' mentoring activity, *(M=24.23, SD=3.43)* and non-mentoring activity *(M=17.55, SD=3.34), t(78)= 0.10 and p=0.001*. This implied that the post-test performance of the learners exposed to mentoring activity was higher compared to non-mentoring activity. It implied that the performance of learners exposed to math aiders mentoring activity and non-mentoring activity had improved after the intervention.

Table 4. The difference in the Post-Test Performance of Learners Exposed to Mentoring Activity and Non-Mentoring Activity

Group	Mean	SD	Mean Difference	CI Lower	CI Upper	t	df	p
Mentoring	24.23	3.44						
			6.68	-8.18	-5.17	-8.81	78	0.001*
Non-mentoring	17.55	3.34						

Conclusions

The learners' performance in the pre-test in mathematics revealed that learners do have not enough stored knowledge with the lesson. The learners need more attention and guidance since the result showed a fairly satisfactory in the pretest which shows that learners need help throughout the performance. A significant difference was noted in the pre-test and post-test scores of learners in both interventions. Both interventions have a positive effect on the learners' achievement in mathematics and can be used as a remedial class for low-performing students. These methods are effective in developing learners' understanding and skills in Mathematics. It is said that learners are capable to understand and learn regardless of the teaching strategies or methods of the teachers applied. However, students' achievement in mathematics in math aiders mentoring program was higher compared to non-mentoring activity. This result implies that the math aiders mentoring program was better compared to the non-mentoring program. With the

e-ISSN : 26203502
p-ISSN : 26153785

help of "math aiders", low-performing learners can perform better in mathematics. The developed mentoring program may help teachers in conducting remedial classes as a new technique in the teaching and learning process.

References

1. Acharya, B. R. (2017). Diversity in mathematics education, Kathmandu: Pinnacle publication Pvt.
2. Anastasia, T. T., Skinner, R. L., & Mundhenk, S. E. (2012). Youth Mentoring: Program and
3. Mentor Best Practices. *Journal of Family & Consumer Sciences*, *104*(2).
4. Davies, P. J. & Hersh, R. (2012). *The Mathematical Experience*. Boston:Mifflin Company.
5. Judd, M. M. (2017). Impacts of mentoring program on at-risk students (Unpublished Doctor of Education Thesis). Murray State University, South West Kentucky.
6. Muijs, A., Reynolds, F. (2008). *Case study research: Theory, Practice, Methods*. Bingley Emerald
7. Petosa, R. L., & Smith, L. H. (2014). Peer mentoring for health behavior change: A systematic review. *American Journal of Health Education*, *45*(6), 351-357.
8. Sa'ad, T. U., Adamu, A., & Sadiq, A. M. (2014). The causes of poor performance in mathematics among public senior secondary school students in Azare metropolis of Bauchi State, Nigeria. *Journal of Research & Method in Education*, *4*(6), 32.
9. Thompson, L. A., & Kelly-Vance, L. (2001). The impact of mentoring on academic achievement of at-risk youth. *Children and Youth Services Review*, *23*(3), 227-242.
10. Umameh, M. A. (2011). A survey of factors responsible for students' poor performance in mathematics in senior secondary school certificate examination (SSCE) in Idah local government area of Kogi state, Nigeria. *Unpublished M. Ed Thesis, University of Benin, Benin City*.